

Reconstructing the High Mass Dimuon Continuum using PYTHIA Simulation as a Baseline for Data Analysis at PHENIX

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Dilepton pairs produced from nucleus-nucleus collisions at the Relativistic Heavy Ion Collider (RHIC) are important probes for studying the properties of the hot and dense matter state created from these collisions, as they are not affected by the strong interactions. In the high mass region, between the J/Ψ and Y resonances, open charm and open bottom decays dominate the dilepton mass spectra. An additional component of the high mass dilepton spectra is from the Drell-Yan process, which contributes an order of magnitude less than open heavy meson decays.

Very recently, PHENIX has published the measurement of the e^+e^- pair continuum in p+p and Au+Au at $\sqrt{s_{NN}} = 200$ GeV in the central rapidity region [1]. In this poster, a simulation study of the reconstruction of the high mass dimuon continuum between 3 and 12 GeV, with the PYTHIA event generator within the PHENIX muon arms acceptance ($1.2 < |y| < 2.2$) will be presented. Contributions from open charm, open bottom, and Drell-Yan processes are included, in addition to J/Ψ , Ψ' , Y , Y' , Y'' resonance states. These results will be used to analyze the dimuon continuum components from p+p data at $\sqrt{s_{NN}} = 200$ GeV taken in 2006 and 2008 at RHIC. The p+p results will be further used as a baseline for analyzing the Au+Au data taken in 2010.

Reference:

[1] A. Adare et. al., Phys. Rev. C 81, 034911 (2010).